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<110> Kainoh, Mie
Tanaka, Toshiaki

<120> Chimeric Proteins, their Heterodimer Complexes, and Platelet Substitutes

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<140> 09/155,514
<141> 1998-11-17

<150> WO PCT/JP98/00370
<151> 1998-01-29

<150> JP 9-15118
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aac tgg ctc gcc aac gct tca gtg atc aat ccc ggg gcg att tac aga   288
Asn Trp Leu Ala Asn Ala Ser Val Ile Asn Pro Gly Ala Ile Tyr Arg
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tgc agg atc gga aag aat ccc ggc cag acg tgc gaa cag ctc cag ctg   336
Cys Arg Ile Gly Lys Asn Pro Gly Gln Thr Cys Glu Gln Leu Gln Leu
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ggt agc cct aat gga gaa cct tgt gga aag act tgt ttg gaa gag aga   384
Gly Ser Pro Asn Gly Glu Pro Cys Gly Lys Thr Cys Leu Glu Glu Arg
        115                 120                 125

gac aat cag tgg ttg ggg gtc aca ctt tcc aga cag cca gga gaa aat   432
Asp Asn Gln Trp Leu Gly Val Thr Leu Ser Arg Gln Pro Gly Glu Asn
    130                 135                 140

gga tcc atc gtg act tgt ggg cat aga tgg aaa aat ata ttt tac ata   480
Gly Ser Ile Val Thr Cys Gly His Arg Trp Lys Asn Ile Phe Tyr Ile
145                 150                 155                 160

aag aat gaa aat aag ctc ccc act ggt ggt tgc tat gga gtg ccc cct   528
Lys Asn Glu Asn Lys Leu Pro Thr Gly Gly Cys Tyr Gly Val Pro Pro
                165                 170                 175

gat tta cga aca gaa ctg agt aaa aga ata gct ccg tgt tat caa gat   576
Asp Leu Arg Thr Glu Leu Ser Lys Arg Ile Ala Pro Cys Tyr Gln Asp
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Tyr Val Lys Lys Phe Gly Glu Asn Phe Ala Ser Cys Gln Ala Gly Ile
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tcc agt ttt tac aca aag gat tta att gtg atg ggg gcc cca gga tca   672
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225                 230                 235                 240

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ata ttc agc att gat gaa aaa gaa cta aat atc tta cat gaa atg aaa   912
Ile Phe Ser Ile Asp Glu Lys Glu Leu Asn Ile Leu His Glu Met Lys
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agc acc atc aga gag gaa gga aga gtg ttt gtg tac atc aac tct ggc   1056
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tcg gga gca gta atg aat gca atg gaa aca aac ctc gtt gga agt gac   1104
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        355                 360                 365

aaa tat gct gca aga ttt ggg gaa tct ata gtt aat ctt ggc gac att   1152
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gac aat gat ggc ttt gaa gat gtt gct atc gga gct cca caa gaa gat   1200
Asp Asn Asp Gly Phe Glu Asp Val Ala Ile Gly Ala Pro Gln Glu Asp
385                 390                 395                 400

gac ttg caa ggt gct att tat att tac aat ggc cgt gca gat ggg atc   1248
Asp Leu Gln Gly Ala Ile Tyr Ile Tyr Asn Gly Arg Ala Asp Gly Ile
                405                 410                 415

tcg tca acc ttc tca cag aga att gaa gga ctt cag atc agc aaa tcg   1296
Ser Ser Thr Phe Ser Gln Arg Ile Glu Gly Leu Gln Ile Ser Lys Ser
            420                 425                 430

tta agt atg ttt gga cag tct ata tca gga caa att gat gca gat aat   1344
Leu Ser Met Phe Gly Gln Ser Ile Ser Gly Gln Ile Asp Ala Asp Asn
        435                 440                 445

aat ggc tat gta gat gta gca gtt ggt gct ttt cgg tct gat tct gct   1392
Asn Gly Tyr Val Asp Val Ala Val Gly Ala Phe Arg Ser Asp Ser Ala
    450                 455                 460

gtc ttg cta agg aca aga cct gta gta att gtt gac gct tct tta agc   1440
Val Leu Leu Arg Thr Arg Pro Val Val Ile Val Asp Ala Ser Leu Ser
465                 470                 475                 480

cac cct gag tca gta aat aga acg aaa ttt gac tgt gtt gaa aat gga   1488
His Pro Glu Ser Val Asn Arg Thr Lys Phe Asp Cys Val Glu Asn Gly
                485                 490                 495

tgg cct tct gtg tgc ata gat cta aca ctt tgt ttc tca tat aag ggc   1536
Trp Pro Ser Val Cys Ile Asp Leu Thr Leu Cys Phe Ser Tyr Lys Gly
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aag gaa gtt cca ggt tac att gtt ttg ttt tat aac atg agt ttg gat   1584
Lys Glu Val Pro Gly Tyr Ile Val Leu Phe Tyr Asn Met Ser Leu Asp
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Val Asn Arg Lys Ala Glu Ser Pro Pro Arg Phe Tyr Phe Ser Ser Asn
    530                 535                 540

gga act tct gac gtg att aca gga agc ata cag gtg tcc agc aga gaa   1680
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atc ctc acc cca att cag att gaa gct gct tac cac ctt ggt cct cat   1776
Ile Leu Thr Pro Ile Gln Ile Glu Ala Ala Tyr His Leu Gly Pro His
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gtc atc agt aaa cga agt aca gag gaa ttc cca cca ctt cag cca att   1824
Val Ile Ser Lys Arg Ser Thr Glu Glu Phe Pro Pro Leu Gln Pro Ile
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ctt cag cag aag aaa gaa aaa gac ata atg aaa aaa aca ata aac ttt   1872
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gca agg ttt tgt gcc cat gaa aat tgt tct gct gat tta cag gtt tct   1920
Ala Arg Phe Cys Ala His Glu Asn Cys Ser Ala Asp Leu Gln Val Ser
625                 630                 635                 640

gca aag att ggg ttt ttg aag ccc cat gaa aat aaa aca tat ctt gct   1968
Ala Lys Ile Gly Phe Leu Lys Pro His Glu Asn Lys Thr Tyr Leu Ala
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gtt ggg agt atg aag aca ttg atg ttg aat gtg tcc ttg ttt aat gct   2016
Val Gly Ser Met Lys Thr Leu Met Leu Asn Val Ser Leu Phe Asn Ala
            660                 665                 670

gga gat gat gca tat gaa acg act cta cat gtc aaa cta ccc gtg ggt   2064
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ctt tat ttc att aag att tta gag ctg gaa gag aag caa ata aac tgt   2112
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gaa gtc aca gat aac tct ggc gtg gta caa ctt gac tgc agt att ggc   2160
Glu Val Thr Asp Asn Ser Gly Val Val Gln Leu Asp Cys Ser Ile Gly
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tat ata tat gta gat cat ctc tca agg ata gat att agc ttt ctc ctg   2208
Tyr Ile Tyr Val Asp His Leu Ser Arg Ile Asp Ile Ser Phe Leu Leu
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gat gtg agc tca ctc agc aga gcg gaa gag gac ctc agt atc aca gtg   2256
Asp Val Ser Ser Leu Ser Arg Ala Glu Glu Asp Leu Ser Ile Thr Val
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His Ala Thr Cys Glu Asn Glu Glu Glu Met Asp Asn Leu Lys His Ser
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aga gtg act gta gca ata cct tta aaa tat gag gtt aag ctg act gtt   2352
Arg Val Thr Val Ala Ile Pro Leu Lys Tyr Glu Val Lys Leu Thr Val
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cat ggg ttt gta aac cca act tca ttt gtg tat gga tca aat gat gaa   2400
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Met Val Pro Asn Ser Phe Ser Pro Gln Thr Asp Lys Leu Phe Asn Ile
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ttg gat gtc cag act act act gga gaa tgc cac ttt gaa aat tat caa   2592
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aga gtg tgt gca tta gag cag caa aag agt gca atg cag acc ttg aaa   2640
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cca tcc att tta gaa atg gat gag act tca gca ctc aag ttt gaa ata   2832
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aga gca aca ggt ttt cca gag cca aat cca aga gta att gaa cta aac   2880
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gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg   3640
Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
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cgg gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc   3736
Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
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cctaca ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc    3946
       Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
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cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa   3994
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ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg cag   4042
Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
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ccg gag aac aac tac aag acc acg cct ccc gtg ctg gat tcc gac ggc   4090
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tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg cag   4138
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tgt gtg ttt gct caa aca gat gaa aat aga tgt tta aaa gca aat gcc   96
Cys Val Phe Ala Gln Thr Asp Glu Asn Arg Cys Leu Lys Ala Asn Ala
            20                  25                  30

aaa tca tgt gga gaa tgt ata caa gca ggg cca aat tgt ggg tgg tgc   144
Lys Ser Cys Gly Glu Cys Ile Gln Ala Gly Pro Asn Cys Gly Trp Cys
        35                  40                  45

aca aat tca aca ttt tta cag gaa gga atg cct act tct gca cga tgt   192
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    50                  55                  60

gat gat tta gaa gcc tta aaa aag aag ggt tgc cct cca gat gac ata   240
Asp Asp Leu Glu Ala Leu Lys Lys Lys Gly Cys Pro Pro Asp Asp Ile
65                  70                  75                  80

gaa aat ccc aga ggc tcc aaa gat ata aag aaa aat aaa aat gta acc   288
Glu Asn Pro Arg Gly Ser Lys Asp Ile Lys Lys Asn Lys Asn Val Thr
                85                  90                  95

aac cgt agc aaa gga aca gca gag aag ctc aag cca gag gat att cat   336
Asn Arg Ser Lys Gly Thr Ala Glu Lys Leu Lys Pro Glu Asp Ile His
            100                 105                 110

cag atc caa cca cag cag ttg gtt ttg cga tta aga tca ggg gag cca   384
Gln Ile Gln Pro Gln Gln Leu Val Leu Arg Leu Arg Ser Gly Glu Pro
        115                 120                 125

cag aca ttt aca tta aaa ttc aag aga gct gaa gac tat ccc att gac   432
Gln Thr Phe Thr Leu Lys Phe Lys Arg Ala Glu Asp Tyr Pro Ile Asp
    130                 135                 140

ctc tac tac ctt atg gac ctg tct tat tca atg aaa gac gat ttg gag   480
Leu Tyr Tyr Leu Met Asp Leu Ser Tyr Ser Met Lys Asp Asp Leu Glu
145                 150                 155                 160

aat gta aaa agt ctt gga aca gat ctg atg aat gaa atg agg agg att   528
Asn Val Lys Ser Leu Gly Thr Asp Leu Met Asn Glu Met Arg Arg Ile
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act tcg gac ttc aga att gga ttt ggc tca ttt gtg gaa aag act gtg   576
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Thr Ser Asp Phe Arg Ile Gly Phe Gly Ser Phe Val Glu Lys Thr Val
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atg cct tac att agc aca aca cca gct aag ctc agg aac cct tgc aca   624
Met Pro Tyr Ile Ser Thr Thr Pro Ala Lys Leu Arg Asn Pro Cys Thr
        195                 200                 205

agt gaa cag aac tgc acc acc cca ttt agc tac aaa aat gtg ctc agt   672
Ser Glu Gln Asn Cys Thr Thr Pro Phe Ser Tyr Lys Asn Val Leu Ser
    210                 215                 220

ctt act aat aaa gga gaa gta ttt aat gaa ctt gtt gga aaa cag cgc   720
Leu Thr Asn Lys Gly Glu Val Phe Asn Glu Leu Val Gly Lys Gln Arg
225                 230                 235                 240

ata tct gga aat ttg gat tct cca gaa ggt ggt ttc gat gcc atc atg   768
Ile Ser Gly Asn Leu Asp Ser Pro Glu Gly Gly Phe Asp Ala Ile Met
                245                 250                 255

caa gtt gca gtt tgt gga tca ctg att ggc tgg agg aat gtt aca cgg   816
Gln Val Ala Val Cys Gly Ser Leu Ile Gly Trp Arg Asn Val Thr Arg
            260                 265                 270

ctg ctg gtg ttt tcc aca gat gcc ggg ttt cac ttt gct gga gat ggg   864
Leu Leu Val Phe Ser Thr Asp Ala Gly Phe His Phe Ala Gly Asp Gly
        275                 280                 285

aaa ctt ggt ggc att gtt tta cca aat gat gga caa tgt cac ctg gaa   912
Lys Leu Gly Gly Ile Val Leu Pro Asn Asp Gly Gln Cys His Leu Glu
    290                 295                 300

aat aat atg tac aca atg agc cat tat tat gat tat cct tct att gct   960
Asn Asn Met Tyr Thr Met Ser His Tyr Tyr Asp Tyr Pro Ser Ile Ala
305                 310                 315                 320

cac ctt gtc cag aaa ctg agt gaa aat aat att cag aca att ttt gca  1008
His Leu Val Gln Lys Leu Ser Glu Asn Asn Ile Gln Thr Ile Phe Ala
                325                 330                 335

gtt act gaa gaa ttt cag cct gtt tac aag gag ctg aaa aac ttg atc  1056
Val Thr Glu Glu Phe Gln Pro Val Tyr Lys Glu Leu Lys Asn Leu Ile
            340                 345                 350

cct aag tca gca gta gga aca tta tct gca aat tct agc aat gta att  1104
Pro Lys Ser Ala Val Gly Thr Leu Ser Ala Asn Ser Ser Asn Val Ile
        355                 360                 365

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gaa aac ggc aaa ttg tca gaa gga gta aca ata agt tac aaa tct tac  1200
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Cys Lys Asn Gly Val Asn Gly Thr Gly Glu Asn Gly Arg Lys Cys Ser
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ggc ttt acg gag gaa gta gag gtt att ctt cag tac atc tgt gaa tgt   1392
Gly Phe Thr Glu Glu Val Glu Val Ile Leu Gln Tyr Ile Cys Glu Cys
    450                 455                 460

gaa tgc caa agc gaa ggc atc cct gaa agt ccc aag tgt cat gaa gga   1440
Glu Cys Gln Ser Glu Gly Ile Pro Glu Ser Pro Lys Cys His Glu Gly
465                 470                 475                 480

aat ggg aca ttt gag tgt ggc gcg tgc agg tgc aat gaa ggg cgt gtt   1488
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                485                 490                 495

ggt aga cat tgt gaa tgc agc aca gat gaa gtt aac agt gaa gac atg   1536
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Asp Ala Tyr Cys Arg Lys Glu Asn Ser Ser Glu Ile Cys Ser Asn Asn
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aat gaa att tat tct ggc aaa ttc tgc gag tgt gat aat ttc aac tgt   1680
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545                 550                 555                 560

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Asp Arg Ser Asn Gly Leu Ile Cys Gly Gly Asn Gly Val Cys Lys Cys
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cgt gtg tgt gag tgc aac ccc aac tac act ggc agt gca tgt gac tgt   1776
Arg Val Cys Glu Cys Asn Pro Asn Tyr Thr Gly Ser Ala Cys Asp Cys
            580                 585                 590

tct ttg gat act agt act tgt gaa gcc agc aac gga cag atc tgc aat   1824
Ser Leu Asp Thr Ser Thr Cys Glu Ala Ser Asn Gly Gln Ile Cys Asn
        595                 600                 605

ggc cgg ggc atc tgc gag tgt ggt gtc tgt aag tgt aca gat ccg aag   1872
Gly Arg Gly Ile Cys Glu Cys Gly Val Cys Lys Cys Thr Asp Pro Lys
    610                 615                 620

ttt caa ggg caa acg tgt gag atg tgt cag acc tgc ctt ggt gtc tgt   1920
Phe Gln Gly Gln Thr Cys Glu Met Cys Gln Thr Cys Leu Gly Val Cys
625                 630                 635                 640

gct gag cat aaa gaa tgt gtt cag tgc aga gcc ttc aat aaa gga gaa   1968
Ala Glu His Lys Glu Cys Val Gln Cys Arg Ala Phe Asn Lys Gly Glu
                645                 650                 655

aag aaa gac aca tgc aca cag gaa tgt tcc tat ttt aac att acc aag   2016
Lys Lys Asp Thr Cys Thr Gln Glu Cys Ser Tyr Phe Asn Ile Thr Lys
            660                 665                 670

gta gaa agt cgg gac aaa tta ccc cag ccg gtc caa cct gat cct gtg   2064
Val Glu Ser Arg Asp Lys Leu Pro Gln Pro Val Gln Pro Asp Pro Val
        675                 680                 685
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tcc cat tgt aag gag aag gat gtt gac gac tgt tgg ttc tat ttt acg   2112
Ser His Cys Lys Glu Lys Asp Val Asp Asp Cys Trp Phe Tyr Phe Thr
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tat tca gtg aat ggg aac aac gag gtc atg gtt cat gtt gtg gag aat   2160
Tyr Ser Val Asn Gly Asn Asn Glu Val Met Val His Val Val Glu Asn
705                 710                 715                 720

cca gag tgt ccc act ggt cca gag gat ccc gag ctgctggaag caggctcagc 2213
Pro Glu Cys Pro Thr Gly Pro Glu Asp Pro Glu
                725                 730

gctcctgcct ggacgcatcc cggctatgca gccccagtcc agggcagcaa ggcaggcccc 2273
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ctcccagatt ccagtaactc ccaatcttct ctctgca gag ccc aaa tct tgt gac  2568
                                        Glu Pro Lys Ser Cys Asp
                                                    735

aaa act cac aca tgc cca ccg tgc cca ggtaagccag cccaggcctc         2615
Lys Thr His Thr Cys Pro Pro Cys Pro
        740                 745

gccctccagc tcaaggcggg acaggtgccc tagagtagcc tgcatccagg gacaggcccc 2675
agccgggtgc tgacacgtcc acctccatct cttcctca gca cct gaa ctc ctg ggg 2731
                                        Ala Pro Glu Leu Leu Gly
                                                    750

gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc ctc atg   2779
Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
        755                 760                 765

atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc cac   2827
Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
    770                 775                 780

gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg   2875
Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
785                 790                 795                 800

cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc acg tac   2923
His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
                805                 810                 815

cgg gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc   2971
Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
            820                 825                 830

aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc atc   3019
Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile
        835                 840                 845

gag aaa acc atc tcc aaa gcc aaa ggtgggaccc gtggggtgcg agggccacat  3073
Glu Lys Thr Ile Ser Lys Ala Lys
    850                 855

ggacagaggc cggctcggcc cacctctgc cctgagagtg accgctgtac caacctctgt 3133
cctaca ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc    3181
       Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
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cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa   3229
Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
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ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg cag   3277
Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
            890                 895                 900

ccg gag aac aac tac aag acc acg cct ccc gtg ctg gat tcc gac ggc   3325
Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
        905                 910                 915

tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg cag   3373
Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
    920                 925                 930

cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac aac   3421
Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
935                 940                 945                 950

cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa tga           3463
His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys  *
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ccccggagct gca 73

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tta gcg ctc agt caa ggc att tta aat tgt tgt ttg gcc tac aat gtt   96
Leu Ala Leu Ser Gln Gly Ile Leu Asn Cys Cys Leu Ala Tyr Asn Val
            20   25   30

ggt ctc cca gaa gca aaa ata ttt tcc ggt cct tca agt gaa cag ttt   144
Gly Leu Pro Glu Ala Lys Ile Phe Ser Gly Pro Ser Ser Glu Gln Phe
        35   40   45

ggg tat gca gtg cag cag ttt ata aat cca aaa ggc aac tgg tta ctg   192
Gly Tyr Ala Val Gln Gln Phe Ile Asn Pro Lys Gly Asn Trp Leu Leu
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gtt ggt tca ccc tgg agt ggc ttt cct gag aac cga atg gga gat gtg   240
Val Gly Ser Pro Trp Ser Gly Phe Pro Glu Asn Arg Met Gly Asp Val

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65                  70                  75                  80

tat aaa tgt cct gtt gac cta tcc act gcc aca tgt gaa aaa cta aat   288
Tyr Lys Cys Pro Val Asp Leu Ser Thr Ala Thr Cys Glu Lys Leu Asn
                85                  90                  95

ttg caa act tca aca agc att cca aat gtt act gag atg aaa acc aac   336
Leu Gln Thr Ser Thr Ser Ile Pro Asn Val Thr Glu Met Lys Thr Asn
            100                 105                 110

atg agc ctc ggc ttg atc ctc acc agg aac atg gga act gga ggt ttt   384
Met Ser Leu Gly Leu Ile Leu Thr Arg Asn Met Gly Thr Gly Gly Phe
        115                 120                 125

ctc aca tgt ggt cct ctg tgg gca cag caa tgt ggg aat cag tat tac   432
Leu Thr Cys Gly Pro Leu Trp Ala Gln Gln Cys Gly Asn Gln Tyr Tyr
    130                 135                 140

aca acg ggt gtg tgt tct gac atc agt cct gat ttt cag ctc tca gcc   480
Thr Thr Gly Val Cys Ser Asp Ile Ser Pro Asp Phe Gln Leu Ser Ala
145                 150                 155                 160

agc ttc tca cct gca act cag ccc tgc cct tcc ctc ata gat gtt gtg   528
Ser Phe Ser Pro Ala Thr Gln Pro Cys Pro Ser Leu Ile Asp Val Val
                165                 170                 175

gtt gtg tgt gat gaa tca aat agt att tat cct tgg gat gca gta aag   576
Val Val Cys Asp Glu Ser Asn Ser Ile Tyr Pro Trp Asp Ala Val Lys
            180                 185                 190

aat ttt ttg gaa aaa ttt gta caa ggc ctt gat ata ggc ccc aca aag   624
Asn Phe Leu Glu Lys Phe Val Gln Gly Leu Asp Ile Gly Pro Thr Lys
        195                 200                 205

aca cag gtg ggg tta att cag tat gcc aat aat cca aga gtt gtg ttt   672
Thr Gln Val Gly Leu Ile Gln Tyr Ala Asn Asn Pro Arg Val Val Phe
    210                 215                 220

aac ttg aac aca tat aaa acc aaa gaa gaa atg att gta gca aca tcc   720
Asn Leu Asn Thr Tyr Lys Thr Lys Glu Glu Met Ile Val Ala Thr Ser
225                 230                 235                 240

cag aca tcc caa tat ggt ggg gac ctc aca aac aca ttc gga gca att   768
Gln Thr Ser Gln Tyr Gly Gly Asp Leu Thr Asn Thr Phe Gly Ala Ile
                245                 250                 255

caa tat gca aga aaa tat gcc tat tca gca gct tct ggt ggg cga cga   816
Gln Tyr Ala Arg Lys Tyr Ala Tyr Ser Ala Ala Ser Gly Gly Arg Arg
            260                 265                 270

agt gct acg aaa gta atg gta gtt gta act gac ggt gaa tca cat gat   864
Ser Ala Thr Lys Val Met Val Val Val Thr Asp Gly Glu Ser His Asp
        275                 280                 285

ggt tca atg ttg aaa gct gtg att gat caa tgc aac cat gac aat ata   912
Gly Ser Met Leu Lys Ala Val Ile Asp Gln Cys Asn His Asp Asn Ile
    290                 295                 300

ctg agg ttt ggc ata gca gtt ctt ggg tac tta aac aga aac gcc ctt   960
Leu Arg Phe Gly Ile Ala Val Leu Gly Tyr Leu Asn Arg Asn Ala Leu
305                 310                 315                 320

gat act aaa aat tta ata aaa gaa ata aaa gcg atc gct agt att cca   1008
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Asp Thr Lys Asn Leu Ile Lys Glu Ile Lys Ala Ile Ala Ser Ile Pro
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aca gaa aga tac ttt ttc aat gtg tct gat gaa gca gct cta cta gaa   1056
Thr Glu Arg Tyr Phe Phe Asn Val Ser Asp Glu Ala Ala Leu Leu Glu
            340                 345                 350

aag gct ggg aca tta gga gaa caa att ttc agc att gaa ggt act gtt   1104
Lys Ala Gly Thr Leu Gly Glu Gln Ile Phe Ser Ile Glu Gly Thr Val
        355                 360                 365

caa gga gga gac aac ttt cag atg gaa atg tca caa gtg gga ttc agt   1152
Gln Gly Gly Asp Asn Phe Gln Met Glu Met Ser Gln Val Gly Phe Ser
    370                 375                 380

gca gat tac tct tct caa aat gat att ctg atg ctg ggt gca gtg gga   1200
Ala Asp Tyr Ser Ser Gln Asn Asp Ile Leu Met Leu Gly Ala Val Gly
385                 390                 395                 400

gct ttt ggc tgg agt ggg acc att gtc cag aag aca tct cat ggc cat   1248
Ala Phe Gly Trp Ser Gly Thr Ile Val Gln Lys Thr Ser His Gly His
                405                 410                 415

ttg atc ttt cct aaa caa gcc ttt gac caa att ctg cag gac aga aat   1296
Leu Ile Phe Pro Lys Gln Ala Phe Asp Gln Ile Leu Gln Asp Arg Asn
            420                 425                 430

cac agt tca tat tta ggt tac tct gtg gct gca att tct act gga gaa   1344
His Ser Ser Tyr Leu Gly Tyr Ser Val Ala Ala Ile Ser Thr Gly Glu
        435                 440                 445

agc act cac ttt gtt gct ggt gct cct cgg gca aat tat acc ggc cag   1392
Ser Thr His Phe Val Ala Gly Ala Pro Arg Ala Asn Tyr Thr Gly Gln
    450                 455                 460

ata gtg cta tat agt gtg aat gag aat ggc aat atc acg gtt att cag   1440
Ile Val Leu Tyr Ser Val Asn Glu Asn Gly Asn Ile Thr Val Ile Gln
465                 470                 475                 480

gct cac cga ggt gac cag att ggc tcc tat ttt ggt agt gtg ctg tgt   1488
Ala His Arg Gly Asp Gln Ile Gly Ser Tyr Phe Gly Ser Val Leu Cys
                485                 490                 495

tca gtt gat gtg gat aaa gac acc att aca gac gtg ctc ttg gta ggt   1536
Ser Val Asp Val Asp Lys Asp Thr Ile Thr Asp Val Leu Leu Val Gly
            500                 505                 510

gca cca atg tac atg agt gac cta aag aaa gag gaa gga aga gtc tac   1584
Ala Pro Met Tyr Met Ser Asp Leu Lys Lys Glu Glu Gly Arg Val Tyr
        515                 520                 525

ctg ttt act atc aaa aag ggc att ttg ggt cag cac caa ttt ctt gaa   1632
Leu Phe Thr Ile Lys Lys Gly Ile Leu Gly Gln His Gln Phe Leu Glu
    530                 535                 540

ggc ccc gag ggc att gaa aac act cga ttt ggt tca gca att gca gct   1680
Gly Pro Glu Gly Ile Glu Asn Thr Arg Phe Gly Ser Ala Ile Ala Ala
545                 550                 555                 560

ctt tca gac atc aac atg gat ggc ttt aat gat gtg att gtt ggt tca   1728
Leu Ser Asp Ile Asn Met Asp Gly Phe Asn Asp Val Ile Val Gly Ser
                565                 570                 575
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cca cta gaa aat cag aat tct gga gct gta tac att tac aat ggt cat   1776
Pro Leu Glu Asn Gln Asn Ser Gly Ala Val Tyr Ile Tyr Asn Gly His
            580                 585                 590

cag ggc act atc cgc aca aag tat tcc cag aaa atc ttg gga tcc gat   1824
Gln Gly Thr Ile Arg Thr Lys Tyr Ser Gln Lys Ile Leu Gly Ser Asp
        595                 600                 605

gga gcc ttt agg agc cat ctc cag tac ttt ggg agg tcc ttg gat ggc   1872
Gly Ala Phe Arg Ser His Leu Gln Tyr Phe Gly Arg Ser Leu Asp Gly
    610                 615                 620

tat gga gat tta aat ggg gat tcc atc acc gat gtg tct att ggt gcc   1920
Tyr Gly Asp Leu Asn Gly Asp Ser Ile Thr Asp Val Ser Ile Gly Ala
625                 630                 635                 640

ttt gga caa gtg gtt caa ctc tgg tca caa agt att gct gat gta gct   1968
Phe Gly Gln Val Val Gln Leu Trp Ser Gln Ser Ile Ala Asp Val Ala
                645                 650                 655

ata gaa gct tca ttc aca cca gaa aaa atc act ttg gtc aac aag aat   2016
Ile Glu Ala Ser Phe Thr Pro Glu Lys Ile Thr Leu Val Asn Lys Asn
            660                 665                 670

gct cag ata att ctc aaa ctc tgc ttc agt gca aag ttc aga cct act   2064
Ala Gln Ile Ile Leu Lys Leu Cys Phe Ser Ala Lys Phe Arg Pro Thr
        675                 680                 685

aag caa aac aat caa gtg gcc att gta tat aac atc aca ctt gat gca   2112
Lys Gln Asn Asn Gln Val Ala Ile Val Tyr Asn Ile Thr Leu Asp Ala
    690                 695                 700

gat gga ttt tca tcc aga gta acc tcc agg ggg tta ttt aaa gaa aac   2160
Asp Gly Phe Ser Ser Arg Val Thr Ser Arg Gly Leu Phe Lys Glu Asn
705                 710                 715                 720

aat gaa agg tgc ctg cag aag aat atg gta gta aat caa gca cag agt   2208
Asn Glu Arg Cys Leu Gln Lys Asn Met Val Val Asn Gln Ala Gln Ser
                725                 730                 735

tgc ccc gag cac atc att tat ata cag gag ccc tct gat gtt gtc aac   2256
Cys Pro Glu His Ile Ile Tyr Ile Gln Glu Pro Ser Asp Val Val Asn
            740                 745                 750

tct ttg gat ttg cgt gtg gac atc agt ctg gaa aac cct ggc act agc   2304
Ser Leu Asp Leu Arg Val Asp Ile Ser Leu Glu Asn Pro Gly Thr Ser
        755                 760                 765

cct gcc ctt gaa gcc tat tct gag act gcc aag gtc ttc agt att cct   2352
Pro Ala Leu Glu Ala Tyr Ser Glu Thr Ala Lys Val Phe Ser Ile Pro
    770                 775                 780

ttc cac aaa gac tgt ggt gag gat gga ctt tgc att tct gat cta gtc   2400
Phe His Lys Asp Cys Gly Glu Asp Gly Leu Cys Ile Ser Asp Leu Val
785                 790                 795                 800

cta gat gtc cga caa ata cca gct gct caa gaa caa ccc ttt att gtc   2448
Leu Asp Val Arg Gln Ile Pro Ala Ala Gln Glu Gln Pro Phe Ile Val
                805                 810                 815

agc aac caa aac aaa agg tta aca ttt tca gta aca ctg aaa aat aaa   2496
Ser Asn Gln Asn Lys Arg Leu Thr Phe Ser Val Thr Leu Lys Asn Lys
            820                 825                 830
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ttg ttt ttt gca tca ttc tcc cta ccg gtt gat ggg aca gaa gta aca   2592
Leu Phe Phe Ala Ser Phe Ser Leu Pro Val Asp Gly Thr Glu Val Thr
    850                 855                 860

tgc cag gtg gct gca tct cag aag tct gtt gcc tgc gat gta ggc tac   2640
Cys Gln Val Ala Ala Ser Gln Lys Ser Val Ala Cys Asp Val Gly Tyr
865                 870                 875                 880

cct gct tta aag aga gaa caa cag gtg act ttt act att aac ttt gac   2688
Pro Ala Leu Lys Arg Glu Gln Gln Val Thr Phe Thr Ile Asn Phe Asp
                885                 890                 895

ttc aat ctt caa aac ctt cag aat cag gcg tct ctc agt ttc caa gcc   2736
Phe Asn Leu Gln Asn Leu Gln Asn Gln Ala Ser Leu Ser Phe Gln Ala
            900                 905                 910

tta agt gaa agc caa gaa gaa aac aag gct gat aat ttg gtc aac ctc   2784
Leu Ser Glu Ser Gln Glu Glu Asn Lys Ala Asp Asn Leu Val Asn Leu
        915                 920                 925

aaa att cct ctc ctg tat gat gct gaa att cac tta aca aga tct acc   2832
Lys Ile Pro Leu Leu Tyr Asp Ala Glu Ile His Leu Thr Arg Ser Thr
    930                 935                 940

aac ata aat ttt tat gaa atc tct tcg gat ggg aat gtt cct tca atc   2880
Asn Ile Asn Phe Tyr Glu Ile Ser Ser Asp Gly Asn Val Pro Ser Ile
945                 950                 955                 960

gtg cac agt ttt gaa gat gtt ggt cca aaa ttc atc ttc tcc ctg aag   2928
Val His Ser Phe Glu Asp Val Gly Pro Lys Phe Ile Phe Ser Leu Lys
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gta aca aca gga agt gtt cca gta agc atg gca act gta atc atc cac   2976
Val Thr Thr Gly Ser Val Pro Val Ser Met Ala Thr Val Ile Ile His
            980                 985                 990

atc cct cag tat acc aaa gaa aag aac cca ctg atg tac cta act ggg   3024
Ile Pro Gln Tyr Thr Lys Glu Lys Asn Pro Leu Met Tyr Leu Thr Gly
        995                 1000                1005

gtg caa aca gac aag gct ggt gac atc agt tgt aat gca gat atc aat   3072
Val Gln Thr Asp Lys Ala Gly Asp Ile Ser Cys Asn Ala Asp Ile Asn
    1010                1015                1020

cca ctg aaa ata gga caa aca tct tct tct gta tct ttc aaa agt gaa   3120
Pro Leu Lys Ile Gly Gln Thr Ser Ser Ser Val Ser Phe Lys Ser Glu
1025                1030                1035                1040

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Asn Phe Arg His Thr Lys Glu Leu Asn Cys Arg Thr Ala Ser Cys Ser
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aat gtt acc tgc tgg ttg aaa gac gtt cac atg aaa gga gaa tac ttt   3216
Asn Val Thr Cys Trp Leu Lys Asp Val His Met Lys Gly Glu Tyr Phe
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gtt aat gtg act acc aga att tgg aac ggg act ttc gca tca tca acg   3264
Val Asn Val Thr Thr Arg Ile Trp Asn Gly Thr Phe Ala Ser Ser Thr
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Phe Gln Thr Val Gln Leu Thr Ala Ala Ala Glu Ile Asn Thr Tyr Asn
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cct gag ata tat gtg att gaa gat aac act gtt acg att ccc ctg atg   3360
Pro Glu Ile Tyr Val Ile Glu Asp Asn Thr Val Thr Ile Pro Leu Met
1105                1110                1115                1120

ata atg aaa cct gat gag aaa gcc gaa gta cca aca gat ccc gag       3405
Ile Met Lys Pro Asp Glu Lys Ala Glu Val Pro Thr Asp Pro Glu
                1125                1130                1135

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                                                              Glu

ccc aaa tct tgt gac aaa act cac aca tgc cca ccg tgc cca           3807
Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro
            1140                1145                1150

ggtaagccag cccaggcctc gccctccagc tcaaggcggg acaggtgccc tagagtagcc 3867
tgcatccagg gacaggcccc agccgggtgc tgacacgtcc acctccatct cttcctca   3925
gca cct gaa ctc ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa   3973
Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys
                1155                1160                1165

ccc aag gac acc ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg   4021
Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val
            1170                1175                1180

gtg gtg gac gtg agc cac gaa gac cct gag gtc aag ttc aac tgg tac   4069
Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr
        1185                1190                1195

gtg gac ggc gtg gag gtg cat aat gcc aag aca aag ccg cgg gag gag   4117
Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu
    1200                1205                1210

cag tac aac agc acg tac cgg gtg gtc agc gtc ctc acc gtc ctg cac   4165
Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His
1215                1220                1225                1230

cag gac tgg ctg aat ggc aag gag tac aag tgc aag gtc tcc aac aaa   4213
Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys
                1235                1240                1245

gcc ctc cca gcc ccc atc gag aaa acc atc tcc aaa gcc aaa           4255
Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys
            1250                1255                1260

ggtgggaccc gtggggtgcg agggccacat ggacagaggc cggctcggcc caccctctgc 4315
cctgagagtg accgctgtac caacctctgt cctaca ggg cag ccc cga gaa cca   4369
                                    Gly Gln Pro Arg Glu Pro
                                                1265

cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag aac cag   4417
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Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
            1270                1275                1280

gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc   4465
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
        1285                1290                1295

gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg   4513
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
    1300                1305                1310

cct ccc gtg ctg gat tcc gac ggc tcc ttc ttc ctc tac agc aag ctc   4561
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
1315                1320                1325                1330

acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc   4609
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
                1335                1340                1345

gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc   4657
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
            1350                1355                1360

ctg tct ccg ggt aaa tga                                          4675
Leu Ser Pro Gly Lys  *
        1365
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<210> 20
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic DNA oligonucleotide

<400> 20
gctcgagcaa acccagcgca actacgg 27

<210> 21
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic DNA oligonucleotide

<400> 21
atagtgccct gatgaccatt g 21

<210> 22
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<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic DNA oligonucleotide

<400> 22
gatggcttta atgatgtgat tg 22

<210> 23
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<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic DNA oligonucleotide

<400> 23
tgttggtact tcggctttct c 21

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<212> PRT
<213> Artificial Sequence

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<400> 24
Cys Ile Pro Glu Leu Ile Val Cys
1 5

<210> 25
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide circular

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Cys Met Arg Tyr Thr Ser Ala Cys
1 5

<210> 26
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide circular

<400> 26
Cys Glu Trp Met Lys Arg Phe Cys
1 5

<210> 27
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide circular

<400> 27
Cys Tyr Thr Thr Arg Leu Lys Cys
1 5

<210> 28
<211> 8

<212> PRT
<213> Artificial Sequence

<220>
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<400> 28
Cys Leu Arg Tyr Ser Val Pro Cys
 1   5

<210> 29
<211> 8
<212> PRT
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<220>
<223> synthetic peptide circular

<400> 29
Cys Ile Val Asn Arg Leu Gly Cys
 1   5

<210> 30
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<212> PRT
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Cys Gly Leu Gln Ala Leu Pro Cys
 1   5

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<213> Artificial Sequence

<220>
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Cys Lys Leu Lys Gly Thr Met Cys
 1   5

<210> 32
<211> 1218
<212> PRT
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<220>
<223> fusion protein

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Gly Pro Glu Ala Ala Leu Arg Glu Thr Val Met Leu Leu Leu Cys Leu
            20   25   30

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Gly Val Pro Thr Gly Arg Pro Tyr Asn Val Asp Thr Glu Ser Ala Leu
        35                  40                  45
Leu Tyr Gln Gly Pro His Asn Thr Leu Phe Gly Tyr Ser Val Val Leu
    50                  55                  60
His Ser His Gly Ala Asn Arg Trp Leu Leu Val Gly Ala Pro Thr Ala
65                  70                  75                  80
Asn Trp Leu Ala Asn Ala Ser Val Ile Asn Pro Gly Ala Ile Tyr Arg
                85                  90                  95
Cys Arg Ile Gly Lys Asn Pro Gly Gln Thr Cys Glu Gln Leu Gln Leu
            100                 105                 110
Gly Ser Pro Asn Gly Glu Pro Cys Gly Lys Thr Cys Leu Glu Glu Arg
        115                 120                 125
Asp Asn Gln Trp Leu Gly Val Thr Leu Ser Arg Gln Pro Gly Glu Asn
    130                 135                 140
Gly Ser Ile Val Thr Cys Gly His Arg Trp Lys Asn Ile Phe Tyr Ile
145                 150                 155                 160
Lys Asn Glu Asn Lys Leu Pro Thr Gly Gly Cys Tyr Gly Val Pro Pro
                165                 170                 175
Asp Leu Arg Thr Glu Leu Ser Lys Arg Ile Ala Pro Cys Tyr Gln Asp
            180                 185                 190
Tyr Val Lys Lys Phe Gly Glu Asn Phe Ala Ser Cys Gln Ala Gly Ile
        195                 200                 205
Ser Ser Phe Tyr Thr Lys Asp Leu Ile Val Met Gly Ala Pro Gly Ser
    210                 215                 220
Ser Tyr Trp Thr Gly Ser Leu Phe Val Tyr Asn Ile Thr Thr Asn Lys
225                 230                 235                 240
Tyr Lys Ala Phe Leu Asp Lys Gln Asn Gln Val Lys Phe Gly Ser Tyr
                245                 250                 255
Leu Gly Tyr Ser Val Gly Ala Gly His Phe Arg Ser Gln His Thr Thr
            260                 265                 270
Glu Val Val Gly Gly Ala Pro Gln His Glu Gln Ile Gly Lys Ala Tyr
        275                 280                 285
Ile Phe Ser Ile Asp Glu Lys Glu Leu Asn Ile Leu His Glu Met Lys
    290                 295                 300
Gly Lys Lys Leu Gly Ser Tyr Phe Gly Ala Ser Val Cys Ala Val Asp
305                 310                 315                 320
Leu Asn Ala Asp Gly Phe Ser Asp Leu Leu Val Gly Ala Pro Met Gln
                325                 330                 335
Ser Thr Ile Arg Glu Glu Gly Arg Val Phe Val Tyr Ile Asn Ser Gly
            340                 345                 350
Ser Gly Ala Val Met Asn Ala Met Glu Thr Asn Leu Val Gly Ser Asp
        355                 360                 365
Lys Tyr Ala Ala Arg Phe Gly Glu Ser Ile Val Asn Leu Gly Asp Ile
    370                 375                 380
Asp Asn Asp Gly Phe Glu Asp Val Ala Ile Gly Ala Pro Gln Glu Asp
385                 390                 395                 400
Asp Leu Gln Gly Ala Ile Tyr Ile Tyr Asn Gly Arg Ala Asp Gly Ile
                405                 410                 415
Ser Ser Thr Phe Ser Gln Arg Ile Glu Gly Leu Gln Ile Ser Lys Ser
            420                 425                 430
Leu Ser Met Phe Gly Gln Ser Ile Ser Gly Gln Ile Asp Ala Asp Asn
        435                 440                 445
Asn Gly Tyr Val Asp Val Ala Val Gly Ala Phe Arg Ser Asp Ser Ala
    450                 455                 460
Val Leu Leu Arg Thr Arg Pro Val Val Ile Val Asp Ala Ser Leu Ser
465                 470                 475                 480
His Pro Glu Ser Val Asn Arg Thr Lys Phe Asp Cys Val Glu Asn Gly
                485                 490                 495
Trp Pro Ser Val Cys Ile Asp Leu Thr Leu Cys Phe Ser Tyr Lys Gly
            500                 505                 510
Lys Glu Val Pro Gly Tyr Ile Val Leu Phe Tyr Asn Met Ser Leu Asp
        515                 520                 525
Val Asn Arg Lys Ala Glu Ser Pro Pro Arg Phe Tyr Phe Ser Ser Asn
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    530                 535                 540
Gly Thr Ser Asp Val Ile Thr Gly Ser Ile Gln Val Ser Ser Arg Glu
545                 550                 555                 560
Ala Asn Cys Arg Thr His Gln Ala Phe Met Arg Lys Asp Val Arg Asp
                565                 570                 575
Ile Leu Thr Pro Ile Gln Ile Glu Ala Ala Tyr His Leu Gly Pro His
            580                 585                 590
Val Ile Ser Lys Arg Ser Thr Glu Glu Phe Pro Pro Leu Gln Pro Ile
        595                 600                 605
Leu Gln Gln Lys Lys Glu Lys Asp Ile Met Lys Lys Thr Ile Asn Phe
    610                 615                 620
Ala Arg Phe Cys Ala His Glu Asn Cys Ser Ala Asp Leu Gln Val Ser
625                 630                 635                 640
Ala Lys Ile Gly Phe Leu Lys Pro His Glu Asn Lys Thr Tyr Leu Ala
                645                 650                 655
Val Gly Ser Met Lys Thr Leu Met Leu Asn Val Ser Leu Phe Asn Ala
            660                 665                 670
Gly Asp Asp Ala Tyr Glu Thr Thr Leu His Val Lys Leu Pro Val Gly
        675                 680                 685
Leu Tyr Phe Ile Lys Ile Leu Glu Leu Glu Glu Lys Gln Ile Asn Cys
    690                 695                 700
Glu Val Thr Asp Asn Ser Gly Val Val Gln Leu Asp Cys Ser Ile Gly
705                 710                 715                 720
Tyr Ile Tyr Val Asp His Leu Ser Arg Ile Asp Ile Ser Phe Leu Leu
                725                 730                 735
Asp Val Ser Ser Leu Ser Arg Ala Glu Glu Asp Leu Ser Ile Thr Val
            740                 745                 750
His Ala Thr Cys Glu Asn Glu Glu Glu Met Asp Asn Leu Lys His Ser
        755                 760                 765
Arg Val Thr Val Ala Ile Pro Leu Lys Tyr Glu Val Lys Leu Thr Val
    770                 775                 780
His Gly Phe Val Asn Pro Thr Ser Phe Val Tyr Gly Ser Asn Asp Glu
785                 790                 795                 800
Asn Glu Pro Glu Thr Cys Met Val Glu Lys Met Asn Leu Thr Phe His
                805                 810                 815
Val Ile Asn Thr Gly Asn Ser Met Ala Pro Asn Val Ser Val Glu Ile
            820                 825                 830
Met Val Pro Asn Ser Phe Ser Pro Gln Thr Asp Lys Leu Phe Asn Ile
        835                 840                 845
Leu Asp Val Gln Thr Thr Thr Gly Glu Cys His Phe Glu Asn Tyr Gln
    850                 855                 860
Arg Val Cys Ala Leu Glu Gln Gln Lys Ser Ala Met Gln Thr Leu Lys
865                 870                 875                 880
Gly Ile Val Arg Phe Leu Ser Lys Thr Asp Lys Arg Leu Leu Tyr Cys
                885                 890                 895
Ile Lys Ala Asp Pro His Cys Leu Asn Phe Leu Cys Asn Phe Gly Lys
            900                 905                 910
Met Glu Ser Gly Lys Glu Ala Ser Val His Ile Gln Leu Glu Gly Arg
        915                 920                 925
Pro Ser Ile Leu Glu Met Asp Glu Thr Ser Ala Leu Lys Phe Glu Ile
    930                 935                 940
Arg Ala Thr Gly Phe Pro Glu Pro Asn Pro Arg Val Ile Glu Leu Asn
945                 950                 955                 960
Lys Asp Glu Asn Val Ala His Val Leu Leu Glu Gly Leu His His Gln
                965                 970                 975
Arg Pro Lys Arg Tyr Phe Thr Asp Pro Glu Glu Pro Lys Ser Cys Asp
            980                 985                 990
Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly
        995                 1000                1005
Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
    1010                1015                1020
Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu
1025                1030                1035                1040
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Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His
                1045                1050                1055
Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg
            1060                1065                1070
Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
        1075                1080                1085
Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu
    1090                1095                1100
Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
1105                1110                1115                1120
Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu
                1125                1130                1135
Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
            1140                1145                1150
Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
        1155                1160                1165
Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp
    1170                1175                1180
Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His
1185                1190                1195                1200
Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro
                1205                1210                1215
Gly Lys
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<210> 33
<211> 963
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 33

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            20                  25                  30
Lys Ser Cys Gly Glu Cys Ile Gln Ala Gly Pro Asn Cys Gly Trp Cys
        35                  40                  45
Thr Asn Ser Thr Phe Leu Gln Glu Gly Met Pro Thr Ser Ala Arg Cys
    50                  55                  60
Asp Asp Leu Glu Ala Leu Lys Lys Lys Gly Cys Pro Pro Asp Asp Ile
65                  70                  75                  80
Glu Asn Pro Arg Gly Ser Lys Asp Ile Lys Lys Asn Lys Asn Val Thr
                85                  90                  95
Asn Arg Ser Lys Gly Thr Ala Glu Lys Leu Lys Pro Glu Asp Ile His
            100                 105                 110
Gln Ile Gln Pro Gln Gln Leu Val Leu Arg Leu Arg Ser Gly Glu Pro
        115                 120                 125
Gln Thr Phe Thr Leu Lys Phe Lys Arg Ala Glu Asp Tyr Pro Ile Asp
    130                 135                 140
Leu Tyr Tyr Leu Met Asp Leu Ser Tyr Ser Met Lys Asp Asp Leu Glu
145                 150                 155                 160
Asn Val Lys Ser Leu Gly Thr Asp Leu Met Asn Glu Met Arg Arg Ile
                165                 170                 175
Thr Ser Asp Phe Arg Ile Gly Phe Gly Ser Phe Val Glu Lys Thr Val
            180                 185                 190
Met Pro Tyr Ile Ser Thr Thr Pro Ala Lys Leu Arg Asn Pro Cys Thr
        195                 200                 205
Ser Glu Gln Asn Cys Thr Thr Pro Phe Ser Tyr Lys Asn Val Leu Ser
    210                 215                 220
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Leu Thr Asn Lys Gly Glu Val Phe Asn Glu Leu Val Gly Lys Gln Arg
225                 230                 235                 240
Ile Ser Gly Asn Leu Asp Ser Pro Glu Gly Gly Phe Asp Ala Ile Met
                245                 250                 255
Gln Val Ala Val Cys Gly Ser Leu Ile Gly Trp Arg Asn Val Thr Arg
            260                 265                 270
Leu Leu Val Phe Ser Thr Asp Ala Gly Phe His Phe Ala Gly Asp Gly
        275                 280                 285
Lys Leu Gly Gly Ile Val Leu Pro Asn Asp Gly Gln Cys His Leu Glu
    290                 295                 300
Asn Asn Met Tyr Thr Met Ser His Tyr Tyr Asp Tyr Pro Ser Ile Ala
305                 310                 315                 320
His Leu Val Gln Lys Leu Ser Glu Asn Asn Ile Gln Thr Ile Phe Ala
                325                 330                 335
Val Thr Glu Glu Phe Gln Pro Val Tyr Lys Glu Leu Lys Asn Leu Ile
            340                 345                 350
Pro Lys Ser Ala Val Gly Thr Leu Ser Ala Asn Ser Ser Asn Val Ile
        355                 360                 365
Gln Leu Ile Ile Asp Ala Tyr Asn Ser Leu Ser Ser Glu Val Ile Leu
    370                 375                 380
Glu Asn Gly Lys Leu Ser Glu Gly Val Thr Ile Ser Tyr Lys Ser Tyr
385                 390                 395                 400
Cys Lys Asn Gly Val Asn Gly Thr Gly Glu Asn Gly Arg Lys Cys Ser
                405                 410                 415
Asn Ile Ser Ile Gly Asp Glu Val Gln Phe Glu Ile Ser Ile Thr Ser
            420                 425                 430
Asn Lys Cys Pro Lys Lys Asp Ser Asp Ser Phe Lys Ile Arg Pro Leu
        435                 440                 445
Gly Phe Thr Glu Glu Val Glu Val Ile Leu Gln Tyr Ile Cys Glu Cys
    450                 455                 460
Glu Cys Gln Ser Glu Gly Ile Pro Glu Ser Pro Lys Cys His Glu Gly
465                 470                 475                 480
Asn Gly Thr Phe Glu Cys Gly Ala Cys Arg Cys Asn Glu Gly Arg Val
                485                 490                 495
Gly Arg His Cys Glu Cys Ser Thr Asp Glu Val Asn Ser Glu Asp Met
            500                 505                 510
Asp Ala Tyr Cys Arg Lys Glu Asn Ser Ser Glu Ile Cys Ser Asn Asn
        515                 520                 525
Gly Glu Cys Val Cys Gly Gln Cys Val Cys Arg Lys Arg Asp Asn Thr
    530                 535                 540
Asn Glu Ile Tyr Ser Gly Lys Phe Cys Glu Cys Asp Asn Phe Asn Cys
545                 550                 555                 560
Asp Arg Ser Asn Gly Leu Ile Cys Gly Gly Asn Gly Val Cys Lys Cys
                565                 570                 575
Arg Val Cys Glu Cys Asn Pro Asn Tyr Thr Gly Ser Ala Cys Asp Cys
            580                 585                 590
Ser Leu Asp Thr Ser Thr Cys Glu Ala Ser Asn Gly Gln Ile Cys Asn
        595                 600                 605
Gly Arg Gly Ile Cys Glu Cys Gly Val Cys Lys Cys Thr Asp Pro Lys
    610                 615                 620
Phe Gln Gly Gln Thr Cys Glu Met Cys Gln Thr Cys Leu Gly Val Cys
625                 630                 635                 640
Ala Glu His Lys Glu Cys Val Gln Cys Arg Ala Phe Asn Lys Gly Glu
                645                 650                 655
Lys Lys Asp Thr Cys Thr Gln Glu Cys Ser Tyr Phe Asn Ile Thr Lys
            660                 665                 670
Val Glu Ser Arg Asp Lys Leu Pro Gln Pro Val Gln Pro Asp Pro Val
        675                 680                 685
Ser His Cys Lys Glu Lys Asp Val Asp Asp Cys Trp Phe Tyr Phe Thr
    690                 695                 700
Tyr Ser Val Asn Gly Asn Asn Glu Val Met Val His Val Val Glu Asn
705                 710                 715                 720
Pro Glu Cys Pro Thr Gly Pro Glu Asp Pro Glu Glu Pro Lys Ser Cys
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                725                 730                 735
Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly
            740                 745                 750
Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
        755                 760                 765
Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
    770                 775                 780
Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
785                 790                 795                 800
His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
                805                 810                 815
Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
            820                 825                 830
Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile
        835                 840                 845
Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val
    850                 855                 860
Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser
865                 870                 875                 880
Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu
                885                 890                 895
Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro
            900                 905                 910
Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
        915                 920                 925
Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met
    930                 935                 940
His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
945                 950                 955                 960
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<210> 34
<211> 1367
<212> PRT
<213> Artificial Sequence

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<400> 34

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            20                  25                  30
Gly Leu Pro Glu Ala Lys Ile Phe Ser Gly Pro Ser Ser Glu Gln Phe
        35                  40                  45
Gly Tyr Ala Val Gln Gln Phe Ile Asn Pro Lys Gly Asn Trp Leu Leu
    50                  55                  60
Val Gly Ser Pro Trp Ser Gly Phe Pro Glu Asn Arg Met Gly Asp Val
65                  70                  75                  80
Tyr Lys Cys Pro Val Asp Leu Ser Thr Ala Thr Cys Glu Lys Leu Asn
                85                  90                  95
Leu Gln Thr Ser Thr Ser Ile Pro Asn Val Thr Glu Met Lys Thr Asn
            100                 105                 110
Met Ser Leu Gly Leu Ile Leu Thr Arg Asn Met Gly Thr Gly Gly Phe
        115                 120                 125
Leu Thr Cys Gly Pro Leu Trp Ala Gln Gln Cys Gly Asn Gln Tyr Tyr
    130                 135                 140
Thr Thr Gly Val Cys Ser Asp Ile Ser Pro Asp Phe Gln Leu Ser Ala
145                 150                 155                 160
Ser Phe Ser Pro Ala Thr Gln Pro Cys Pro Ser Leu Ile Asp Val Val
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                    165                 170                 175
Val Val Cys Asp Glu Ser Asn Ser Ile Tyr Pro Trp Asp Ala Val Lys
                180                 185                 190
Asn Phe Leu Glu Lys Phe Val Gln Gly Leu Asp Ile Gly Pro Thr Lys
            195                 200                 205
Thr Gln Val Gly Leu Ile Gln Tyr Ala Asn Asn Pro Arg Val Val Phe
        210                 215                 220
Asn Leu Asn Thr Tyr Lys Thr Lys Glu Glu Met Ile Val Ala Thr Ser
225                 230                 235                 240
Gln Thr Ser Gln Tyr Gly Gly Asp Leu Thr Asn Thr Phe Gly Ala Ile
                245                 250                 255
Gln Tyr Ala Arg Lys Tyr Ala Tyr Ser Ala Ala Ser Gly Gly Arg Arg
            260                 265                 270
Ser Ala Thr Lys Val Met Val Val Val Thr Asp Gly Glu Ser His Asp
        275                 280                 285
Gly Ser Met Leu Lys Ala Val Ile Asp Gln Cys Asn His Asp Asn Ile
    290                 295                 300
Leu Arg Phe Gly Ile Ala Val Leu Gly Tyr Leu Asn Arg Asn Ala Leu
305                 310                 315                 320
Asp Thr Lys Asn Leu Ile Lys Glu Ile Lys Ala Ile Ala Ser Ile Pro
                325                 330                 335
Thr Glu Arg Tyr Phe Phe Asn Val Ser Asp Glu Ala Ala Leu Leu Glu
            340                 345                 350
Lys Ala Gly Thr Leu Gly Glu Gln Ile Phe Ser Ile Glu Gly Thr Val
        355                 360                 365
Gln Gly Gly Asp Asn Phe Gln Met Glu Met Ser Gln Val Gly Phe Ser
    370                 375                 380
Ala Asp Tyr Ser Ser Gln Asn Asp Ile Leu Met Leu Gly Ala Val Gly
385                 390                 395                 400
Ala Phe Gly Trp Ser Gly Thr Ile Val Gln Lys Thr Ser His Gly His
                405                 410                 415
Leu Ile Phe Pro Lys Gln Ala Phe Asp Gln Ile Leu Gln Asp Arg Asn
            420                 425                 430
His Ser Ser Tyr Leu Gly Tyr Ser Val Ala Ala Ile Ser Thr Gly Glu
        435                 440                 445
Ser Thr His Phe Val Ala Gly Ala Pro Arg Ala Asn Tyr Thr Gly Gln
    450                 455                 460
Ile Val Leu Tyr Ser Val Asn Glu Asn Gly Asn Ile Thr Val Ile Gln
465                 470                 475                 480
Ala His Arg Gly Asp Gln Ile Gly Ser Tyr Phe Gly Ser Val Leu Cys
                485                 490                 495
Ser Val Asp Val Asp Lys Asp Thr Ile Thr Asp Val Leu Leu Val Gly
            500                 505                 510
Ala Pro Met Tyr Met Ser Asp Leu Lys Lys Glu Glu Gly Arg Val Tyr
        515                 520                 525
Leu Phe Thr Ile Lys Lys Gly Ile Leu Gly Gln His Gln Phe Leu Glu
    530                 535                 540
Gly Pro Glu Gly Ile Glu Asn Thr Arg Phe Gly Ser Ala Ile Ala Ala
545                 550                 555                 560
Leu Ser Asp Ile Asn Met Asp Gly Phe Asn Asp Val Ile Val Gly Ser
                565                 570                 575
Pro Leu Glu Asn Gln Asn Ser Gly Ala Val Tyr Ile Tyr Asn Gly His
            580                 585                 590
Gln Gly Thr Ile Arg Thr Lys Tyr Ser Gln Lys Ile Leu Gly Ser Asp
        595                 600                 605
Gly Ala Phe Arg Ser His Leu Gln Tyr Phe Gly Arg Ser Leu Asp Gly
    610                 615                 620
Tyr Gly Asp Leu Asn Gly Asp Ser Ile Thr Asp Val Ser Ile Gly Ala
625                 630                 635                 640
Phe Gly Gln Val Val Gln Leu Trp Ser Gln Ser Ile Ala Asp Val Ala
                645                 650                 655
Ile Glu Ala Ser Phe Thr Pro Glu Lys Ile Thr Leu Val Asn Lys Asn
            660                 665                 670
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Ala Gln Ile Ile Leu Lys Leu Cys Phe Ser Ala Lys Phe Arg Pro Thr
        675                 680                 685
Lys Gln Asn Asn Gln Val Ala Ile Val Tyr Asn Ile Thr Leu Asp Ala
    690                 695                 700
Asp Gly Phe Ser Ser Arg Val Thr Ser Arg Gly Leu Phe Lys Glu Asn
705                 710                 715                 720
Asn Glu Arg Cys Leu Gln Lys Asn Met Val Val Asn Gln Ala Gln Ser
                725                 730                 735
Cys Pro Glu His Ile Ile Tyr Ile Gln Glu Pro Ser Asp Val Val Asn
            740                 745                 750
Ser Leu Asp Leu Arg Val Asp Ile Ser Leu Glu Asn Pro Gly Thr Ser
        755                 760                 765
Pro Ala Leu Glu Ala Tyr Ser Glu Thr Ala Lys Val Phe Ser Ile Pro
    770                 775                 780
Phe His Lys Asp Cys Gly Glu Asp Gly Leu Cys Ile Ser Asp Leu Val
785                 790                 795                 800
Leu Asp Val Arg Gln Ile Pro Ala Ala Gln Glu Gln Pro Phe Ile Val
                805                 810                 815
Ser Asn Gln Asn Lys Arg Leu Thr Phe Ser Val Thr Leu Lys Asn Lys
            820                 825                 830
Arg Glu Ser Ala Tyr Asn Thr Gly Ile Val Val Asp Phe Ser Glu Asn
        835                 840                 845
Leu Phe Phe Ala Ser Phe Ser Leu Pro Val Asp Gly Thr Glu Val Thr
    850                 855                 860
Cys Gln Val Ala Ala Ser Gln Lys Ser Val Ala Cys Asp Val Gly Tyr
865                 870                 875                 880
Pro Ala Leu Lys Arg Glu Gln Gln Val Thr Phe Thr Ile Asn Phe Asp
                885                 890                 895
Phe Asn Leu Gln Asn Leu Gln Asn Gln Ala Ser Leu Ser Phe Gln Ala
            900                 905                 910
Leu Ser Glu Ser Gln Glu Glu Asn Lys Ala Asp Asn Leu Val Asn Leu
        915                 920                 925
Lys Ile Pro Leu Leu Tyr Asp Ala Glu Ile His Leu Thr Arg Ser Thr
    930                 935                 940
Asn Ile Asn Phe Tyr Glu Ile Ser Ser Asp Gly Asn Val Pro Ser Ile
945                 950                 955                 960
Val His Ser Phe Glu Asp Val Gly Pro Lys Phe Ile Phe Ser Leu Lys
                965                 970                 975
Val Thr Thr Gly Ser Val Pro Val Ser Met Ala Thr Val Ile Ile His
            980                 985                 990
Ile Pro Gln Tyr Thr Lys Glu Lys Asn Pro Leu Met Tyr Leu Thr Gly
        995                 1000                1005
Val Gln Thr Asp Lys Ala Gly Asp Ile Ser Cys Asn Ala Asp Ile Asn
    1010                1015                1020
Pro Leu Lys Ile Gly Gln Thr Ser Ser Ser Val Ser Phe Lys Ser Glu
1025                1030                1035                1040
Asn Phe Arg His Thr Lys Glu Leu Asn Cys Arg Thr Ala Ser Cys Ser
                1045                1050                1055
Asn Val Thr Cys Trp Leu Lys Asp Val His Met Lys Gly Glu Tyr Phe
            1060                1065                1070
Val Asn Val Thr Thr Arg Ile Trp Asn Gly Thr Phe Ala Ser Ser Thr
        1075                1080                1085
Phe Gln Thr Val Gln Leu Thr Ala Ala Ala Glu Ile Asn Thr Tyr Asn
    1090                1095                1100
Pro Glu Ile Tyr Val Ile Glu Asp Asn Thr Val Thr Ile Pro Leu Met
1105                1110                1115                1120
Ile Met Lys Pro Asp Glu Lys Ala Glu Val Pro Thr Asp Pro Glu Glu
                1125                1130                1135
Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
            1140                1145                1150
Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
        1155                1160                1165
Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
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    1170                1175                1180
Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
1185                1190                1195                1200
Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
                1205                1210                1215
Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
            1220                1225                1230
Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
        1235                1240                1245
Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
    1250                1255                1260
Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys
1265                1270                1275                1280
Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
                1285                1290                1295
Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
            1300                1305                1310
Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
        1315                1320                1325
Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
    1330                1335                1340
Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
1345                1350                1355                1360
Leu Ser Leu Ser Pro Gly Lys
                1365
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